Nutritional risk and associated factors in older people with HIV / AIDS and use of antiretroviral therapy in reference centers

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Abstract

Objective: To identify the nutritional risk of older people with HIV / AIDS and the associated factors. *Method*: It is a cross-sectional and analytical study. 241 older people from the Reference Services in Recife/PE, Brazil participated. The dependent variable was Nutritional risk, assessed by the Mini Nutritional Assessment and the independent ones, the sociodemographic, lifestyle and health conditions. *Results:* 44% of participants with nutritional risk were identified. There was an association between nutritional risk and female gender, education between 1-4 years of study and symptoms of depression. *Conclusion:* It is suggested to include screening measures for early intervention of nutritional status, such as Mini Nutritional Assessment in the care routine, with a view to enabling greater comprehensiveness in care in Gerontology and reducing the risk of morbidity and mortality associated with the disease, and promoting longevity of better quality for those living with HIV.

Keywords: Older people. HIV. Nutritional status. Nutritional assessment.

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INTRODUCTION

The occurrence of HIV/AIDS in older people is a public health problem. Between 1996 and 2019, the incidence in the Brazilian population aged 60 and over increased from 5.9 to 12.2 in men and from 1.8 to 5.9 in women, per 100,000[1]. Older people living with HIV are more vulnerable to premature death, since, with the epidemiological transition, it is in this population group that chronic diseases[2] related to an inadequate lifestyle, such as a sedentary lifestyle, consumption of alcohol, smoking and unhealthy eating[3] prevail.

On the one hand, the introduction of antiretroviral therapy (ARVT), from 1996 onwards, reduced the morbidity and mortality rates associated with the infection, improved the quality of life and enabled the longevity of people living with HIV. On the other hand, it favored the occurrence of metabolic alterations and changes in body composition, such as: accumulation of visceral fat, weight loss or overweight and obesity.

From a nutritional point of view, the magnitude of malnutrition in HIV-infected individuals has negative health impacts. The weakening of the immune system caused by the disease is aggravated by malnutrition, increasing susceptibility to opportunistic diseases. As the disease progresses, there is a reduction in the response to antiretrovirals and an increase in mortality rates[4].

Studies that address nutritional assessment in older people with HIV, as an exclusive case series, are still insufficient. The vast majority of manuscripts include assessments with the adult population, including older people in this group. In this context, the metabolic and body composition changes caused by the disease and its treatment are being considered, devaluing the knowledge about the particularities related to the aging process, such as the reduction of body water, the loss of muscle and bone mass (osteopenia), and immunosenescence[5]. The detection of the risk of malnutrition in older people with HIV is important to support the establishment of strategies for early intervention, monitoring and prevention of complications. In this sense, this research aimed to investigate the nutritional status of older people with HIV/AIDS in the city of Recife and its associated factors.

METHODS

Quantitative, cross-sectional and analytical study carried out at reference services for HIV treatment in Recife/PE, Brazil. The municipality has seven reference services for specialized treatment, including the dispensing of medication to people living with HIV. Only two services were not included, due to the lack of timely release of the letter of consent for data collection at the unit. The State STI/AIDS Program, autonomous in each sphere of government, carries out actions to promote the health of the national STI/AIDS Policy; protection of the fundamental rights of people with HIV/AIDS; prevention of transmission of STIs, HIV/AIDS and drug misuse; diagnosis, treatment and assistance to people with STI/HIV/AIDS.

The participants in this study were older people aged at least 60 years, infected with HIV, of both sexes and registered to receive specialized treatment at outpatient, laboratory, drug and inpatient levels, when necessary, in these health services.

To determine the sample size, the number of older people using ARVT was used, according to data from the Health Department of the State of Pernambuco, according to the Medication Logistic Control System (SICLOM), corresponding to a total of 1,032 older people. The Correction Factor for finite population was used, estimating the expected prevalence of 50% for the outcome (nutritional risk), considering the lack of consensus on its magnitude in older people. After establishing a confidence level of 95% and a maximum acceptable error of 5%, the sample size was determined in 241 older people, selected by convenience, from March to August 2017.

The sample was determined by convenience, since the individuals eligible for the research were a minority in the care services, given the predominance of young people. The capture of the older people for the interviews took place in one of three situations: by the presence of the participants for a medical consultation identified on the previous day, in the collection of laboratory tests by appointment and in

the Pharmacy sector, on the occasion of dispensing medications. The older people were identified by the Nursing team and invited to participate by the responsible researcher. The research objectives and all data collection procedures were duly clarified. Those who agreed to participate registered their consent in the Free and Informed Consent Form (ICF). There was only 1.6% of refusals. The interviews were carried out in the morning, during every day of the week until completing the sample, due to the greater demand for attendance of older users to be concentrated in this period.

Older people registered in HIV reference units and using antiretroviral therapy for at least 30 days were included. Individuals with cognitive impairment, assessed using the Mini Mental State Examination – MMSE[6] and unable to have their anthropometric measurements measured (bedridden and wheelchair users) were excluded.

For the dependent variable, the Mini Nutritional Assessment - MNA short form was used, consisting of six questions that classified the older people according to the scores in: normal nutritional status (≥12 points), risk of malnutrition (8 to 11 points) and malnutrition (≤7 points)[7]. The independent variables corresponded to sociodemographic data, health conditions and lifestyle. Sociodemographic data included: sex, age, marital status, education, individual monthly income, condition of living alone, source of financial resources and contribution to family income.

Regarding lifestyle, three modifiable factors were evaluated[8]: physical activity, considered physically active, one whose practice was performed for at least 30 minutes a day, five days a week (150 minutes), including the daily routine walking or by bicycle to work, climbing stairs, if possible every day, continuously or cumulatively.

For smoking, the classification was: non-smoker, ex-smoker and smoker. Current smoking or quitting within a period of less than six months was considered as a Smoker[8]. For alcohol consumption (habit and frequency), the classification was: "no consumption", occasional or rare (less than four times a month), 1-6x/week or daily.

With regard to health conditions, comorbidities were observed from the entries in the medical records. Functional impairment was assessed using the Barthel Index (0-20 total dependence; 21-60, severe dependence; 61-90, moderate dependence; 91-99, very mild dependence and 100, independence)[9]. To screen for depressive symptoms, the Yesavage Geriatric Depression Scale (GDS–15) was used, which considers a result of five or more points as positive for depression[10].

To measure the circumference measurements, a 2 meters long and 1 mm graduation Cescorf® inelastic measuring tape was used. Waist circumference was measured with the older person standing upright, with relaxed abdomen, arms extended along the body and legs closed, measuring the midpoint between the last rib and the iliac crest, with no clothes on the region. The hip circumference was obtained at the level of maximum gluteal extension. Then, the ratio was calculated by dividing the waist measurement by the hip measurement, in centimeters[11,12].

The cut-off point for high risk for waist circumference corresponded to ≥94 for men and ≥80 for women. Measures ≥102 and ≥88 for men and women, respectively, were indicative of very high risk in terms of abdominal adiposity[13]. Values resulting from a waist-to-hip ratio ≥0.85 cm for women and ≥0.95 cm for men were considered as risks for coronary artery disease, hypertension and diabetes. In relation to HIV, viral load was evaluated, based on secondary data of up to 90 days and classified as detectable (>40 copies) or undetectable (≤40 copies)[14].

The association between explanatory variables (sociodemographic and health conditions) and nutritional status (outcome) was performed through bivariate and multivariate analyses. For the outcome, MNA was recategorized as "present" (malnutrition or risk of malnutrition) or "absent" nutritional risk. To determine the factors associated with nutritional risk, in the bivariate analysis, the explanatory variables were observed individually, a contingency table was constructed and the chi-square test for independence was applied. In cases where the assumptions of the chi-square test were not satisfied, Fisher's exact test was applied. All conclusions were made considering a 5% significance level. In the multivariate analysis,

Poisson regression was used. The prevalence ratio was adopted as a measure of association with their respective confidence intervals.

Variables in which the association test showed significance of up to 20% ($p \leq 0.20$) in the bivariate analysis were included in the multivariate model. To assess which factors jointly influence nutritional risk, the Poisson multivariate model was adjusted with a robust covariance matrix to obtain the corresponding estimates of the prevalence ratios (PR). Initially, an individual model was adjusted for each group of variables. In the adjustment of each multivariate model, a significance level of 5% was considered for the permanence of the variable.

The present study derives from the project "Identification of the Social and Epidemiological Profile of older people infected by HIV/AIDS assisted in reference services". Approved by the Research Ethics Committee of the Health Sciences Center of the Federal University of Pernambuco, with opinion number 1,707,44. This research met the prerequisites established by resolutions 466/2012 and 510/2016 of the Ministry of Health, regarding ethical principles involving scientific research with human beings. In addition, the term of consent and free clarification was used.

RESULTS

The sample consisted of 241 older people with a predominance of men, aged between 65 and 69 years, single, with up to four years of education, monthly income of up to two minimum wages, living with other people, main income from retirement and total contribution to the family income. (Table 1)

Regarding lifestyle and health conditions, older people who practiced physical activity, former smokers, who did not use alcohol, functionally independent, with negative screening for depressive symptoms, no risk for malnutrition and waist circumference and risk for waist-hip. Regarding viral load, 87.9% were classified as undetectable. (Table 1)

Regarding comorbidities, there was a higher frequency for systemic arterial hypertension, followed by diabetes mellitus, as shown in Table 2.

Table 3 shows the distribution of nutritional risk, according to sociodemographic profile, lifestyle and health conditions. There is a higher prevalence in female older people, aged 70 years or older, widowed, with up to four years of education, monthly income of one to two minimum wages, retired and with a partial contribution to the family income. Regarding lifestyle factors and health conditions, there was a higher prevalence of nutritional risk in the group of older people with severe dependence, suspected depression, who practiced physical activity, smokers, who drank alcohol from 1 to 6 times a week, no risk to waist circumference, no risk to waist-hip and detectable viral load.

The characteristics that were associated with nutritional risk were: sex ($p=0.002$), education ($p=0.003$), depressive symptoms ($p<0.001$), waist circumference ($p=0.012$), viral load classification ($p=0.047$).

The distribution of nutritional risk, according to the investigated comorbidities, is described in table 4. There is a positive association between nutritional risk and the occurrence of osteoarthrosis ($p=0.018$).

Variables with $p<0.20$ in the bivariate analysis (sex, education, source of financial resources, CVD, osteoporosis, osteoarthrosis, renal dysfunction, waist circumference, functional impairment, viral load and depressive symptoms) were included in the multivariate model.

In the adjusted model, a significance level of 5% was considered in the Wald chi-square test, with the following variables remaining: sex, education, waist circumference and depressive symptoms (Table 5).

Table 1. Distribution of the sociodemographic profile, lifestyle and health conditions in older people infected by HIV/AIDS assisted in Reference Units. Recife, PE, 2021.

Evaluated factors	n (%)	*p*-value
Sociodemographic		
Sex		
Male	151 (62.7)	<0.001
Female	90 (37.3)	
Age		
60 to 64 years	61 (25.3)	0.001
65 to 69 years	108 (44.8)	
70 or more	72 (29.9)	
Marital status		
Single	83 (34.4)	<0.001
Married/with a partner	74 (30.7)	
Widower	45 (18.7)	
Separated/Divorced	39 (16.2)	
Education		
Illiterate	25 (10.4)	<0.001
1 to 4 years	69 (28.6)	
5 to 8 years	59 (24.5)	
9 to 11 years	56 (23.2)	
Over 11 years	32 (13.3)	
Individual monthly income*		
No income	51 (6.2)	<0.001
<1 MW	27 (11.2)	
1 to 2 MW	134 (55.7)	
2 to 4 MW	36 (14.9)	
More than 4 MW	29 (12.0)	
Lives alone		
No	166 (68.9)	<0.001
Yes	75 (31.1)	
How many people do you live with?		
Only with partner	40 (16.6)	
With more people	126 (52.3)	
Origin of financial resources		
Does not have its own earnings	19 (7.9)	<0.001
Salary or informal activity	38 (15.8)	
Retired	156 (64.7)	
Pensioner	18 (7.5)	
Retired and pensioner	10 (4.1)	
Contribution to family income		
Fully	137 (56.8)	<0.001
Partially	86 (35.7)	
Does not contribute	18 (7.5)	

to be continued

Continuation of Table 1

Evaluated factors	n (%)	*p*-value
Lifestyle		
Physical activity		
No	113 (46.9)	0.334
Yes	128 (53.1)	
Smoking		
Never smoked	96 (39.8)	<0.001
Ex smoker	105 (43.6)	
Smoker	40 (16.6)	
Alcoholic beverage consumption		
Daily	3 (1.2)	<0.001
1 to 6 times a week	14 (5.8)	
Occasionally or rarely	60 (24.9)	
No consumption	164 (68.0)	
Health conditions		
Functional impairment		
Severe dependence	1 (0.4)	<0.001
Moderate dependence	15 (6.2)	
Light dependency	22 (9.1)	
Independence	203 (84.3)	
Depressive symptoms		
No suspicion of depression	161 (67.1)	<0.001
With suspected depression	79 (32.9)	
Mini nutritional assessment		
Normal	134 (55.8)	
Nutritional risk	87 (36.3)	<0.001
Malnourished	19 (7.9)	
Waist circumference		
Without risk	105 (43.6)	0.001
High risk	56 (23.2)	
Very high risk	80 (33.2)	
Waist-hip ratio		
No cardiovascular risk	115 (47.9)	0.519
With cardiovascular risk	125 (52.1)	
Viral load rating		
Detectable	24 (12.1)	<0.001
Not detectable	174 (87.9)	

p-value of the chi-square test for proportion comparison;*In minimum wage (MW), in force in Brazil in 2017, equivalent to R$ 937.00.

Table 2. Distribution of comorbidities investigated in older people infected by HIV/AIDS assisted in Reference Units. Recife - PE, 2021.

Evaluated factor	Absent	Present	No information	*p*-value
Systemic arterial hypertension (SAH)	133(55.2%)	94(39.0%)	14(5.8%)	<0.001
Diabetes Mellitus (DM)	167(69.3%)	59(24.5%)	15(6.2%)	<0.001
Cardiovascular disease (CVD)	200(83.0%)	24(10.0%)	17(7.0%)	<0.001
Osteoporosis	194(80.5%)	31(12.9%)	16(6.6%)	<0.001
Osteoarthrosis	201(83.4%)	26(10.8%)	14(5.8%)	<0.001
Neurological diseases	213(88.4%)	11(4.5%)	17(7.1%)	<0.001
Respiratory diseases	213(88.4%)	10(4.1%)	18(7.5%)	<0.001
Neoplasm	221(91.7%)	4(1.7%)	16(6.6%)	<0.001
Depression	212(88.0%)	12(4.9%)	17(7.1%)	<0.001
Chronic diseases	146(60.6%)	2(34.0%)	3(5.4%)	<0.001

p-value of the chi-square test for proportion comparison.

Table 3. Distribution of nutritional risk, according to sociodemographic profile, lifestyle and health conditions in older people infected with HIV/AIDS assisted in Reference Units. Recife - PE, 2021.

Evaluated factors	Nutritional risk		*p*-value
	Present	Absent	
Sociodemographic			
Sex			
Male	55(36.4%)	96(63.6%)	0.002[1]
Female	51(57.3%)	38(42.7%)	
Age			
60 to 64 years	25(41.0%)	36(59.0%)	0.212[1]
65 to 69 years	43(40.2%)	64(59.8%)	
70 or more	38(52.8%)	34(47.2%)	
Marital status			
Single	39(47.0%)	44(53.0%)	0.703[1]
Married/with a partner	30(40.5%)	44(59.5%)	
Widower	22(48.9%)	23(51.1%)	
Separated/Divorced	15(39.5%)	23(60.5%)	
Education (years)			
0	13(52.0%)	12(48.0%)	0.003[1]
1 to 4 years	43(62.3%)	26(37.7%)	
5 to 8 years	21(35.6%)	38(64.0%)	
9 to 11 years	19(34.5%)	36(65.5%)	
Over 11 years	10(31.2%)	22(68.8%)	
Individual monthly income*			
No income	6(40.0%)	9(60.0%)	0.667[1]
<1 MW	12(44.4%)	15(55.6%)	
1 to 2 MW	63(47.4%)	70(52.6%)	
2 to 4 MW	12(33.3%)	24(66.7%)	
More than 4 MW	13(44.8%)	16(55.2%)	

to be continued

Continuation of Table 3

Evaluated factors	Nutritional risk		*p*-value
	Present	Absent	
Lives alone			
No	74(44.6%)	92(55.4%)	0.847[1]
Yes	32(43.2%)	42(56.8%)	
How many people do you live with?			
Only with partner	16(40.0%)	24(60.0%)	
With more people	58(46.0%)	68(54.0%)	
Origin of financial resources			
Does not have its own earnings	9(47.4%)	10(52.6%)	0.111[1]
Salary or informal activity	11(28.9%)	27(71.1%)	
Retired	76(49.0%)	79(51.0%)	
Pensioner	8(44.4%)	10(55.6%)	
Retired and pensioner	2(20.0%)	8(80.0%)	
Contribution to family income			
Fully	58(42.6%)	78(57.4%)	0.852[1]
Partially	40(46.5%)	46(53.5%)	
Does not contribute	8(44.4%)	10(55.6%)	
Lifestyle			
Physical activity			
No	48(42.9%)	64(57.1%)	0.702[1]
Yes	58(45.3%)	70(54.7%)	
Smoking			
Never smoked	46(47.9%)	50(52.1%)	
Ex smoker	40(38.5%)	64(61.5%)	0.291[1]
Smoker	20(50.0%)	20(50.0%)	
Alcoholic beverage consumption			
Daily	0(0.0%)	3(100.0%)	
1 to 6 times a week	8(61.5%)	5(38.5%)	
Occasionally or rarely	27(45.0%)	33(55.0%)	0.314[2]
No consumption	71(43.3%)	93(56.7%)	
Health Conditions			
Functional impairment			
Severe dependence	1(100.0%)	0(0.0%)	
Moderate dependence	10(66.7%)	5(33.3%)	
Light dependency	11(50.0%)	11(50.0%)	0.124[2]
Independence	84(41.6%)	118(58.4%)	
Depressive symptoms			
No suspicion of depression	62(38.8%)	98(61.3%)	0.013[1]
With suspected depression	44(55.7%)	35(44.3%)	
Waist circumference			
Without risk	57(54.3%)	48(45.7%)	
High risk	23(41.8%)	32(58.2%)	0.012[1]
Very high risk	26(32.5%)	54(67.5%)	

to be continued

Continuação da Tabela 3

Evaluated factors	Nutritional risk		*p*-value
	Present	Absent	
Waist-hip ratio			
No cardiovascular risk	52(45.6%)	62(54.4%)	0.617[1]
With cardiovascular risk	53(42.4%)	72(57.6%)	
Viral load rating			
Detectable	15(62.5%)	9(37.5%)	0.047[1]
Not detectable	71(41.0%)	102(59.0%)	

[1]*p*-value of the chi-square test for independence; [2]p-value of Fisher's exact test; ;*In minimum wage (MW), in force in Brazil in 2017, equivalent to R$ 937.00.

Source: Data obtained from the survey, 2021.

Table 4. Distribution of nutritional risk, according to comorbidities in older people infected by HIV/AIDS assisted in Reference Units. Recife - PE, 2021.

Evaluated factors	Nutritional risk		*p*-value
	Present	Absent	
Systemic arterial hypertension (SAH)			
Absent	57(43.2%)	75(56.8%)	0.702[1]
Present	43(45.7%)	51(54.3%)	
Diabetes Mellitus (DM)			
Absent	71(42.8%)	95(57.2%)	0.533[1]
Present	28(47.5%)	31(52.5%)	
Cardiovascular disease (CVD)			
Absent	84(42.2%)	115(57.8%)	0.133[1]
Present	14(58.3%)	10(41.7%)	
Osteoporosis			
Absent	80(41.5%)	113(58.5%)	0.083[1]
Present	18(58.1%)	13(41.9%)	
Osteoarthrosis			
Absent	82(41.0%)	118(59.0%)	0.018[1]
Present	17(65.4%)	9(34.6%)	
Neurological diseases			
Absent	95(44.8%)	117(55.2%)	0.355[2]
Present	3(27.3%)	8(72.7%)	
Respiratory diseases			
Absent	94(44.3%)	118(55.7%)	1.000[2]
Present	4(40.0%)	6(60.0%)	
Neoplasia			
Absent	97(44.1%)	123(55.9%)	1.000[2]
Present	2(50.0%)	2(50.0%)	
Depression			
Absent	92(43.6%)	119(56.4%)	0.664[1]
Present	6(50.0%)	6(50.0%)	

to be continued

Continuation of Table 4

Evaluated factors	Nutritional risk		*p*-value
	Present	Absent	
Kidney dysfunction			
Absent	42(42.4%)	57(57.6%)	0.140[2]
Present	1(12.5%)	7(87.5%)	
Chronic diseases			
Absent	67(45.9%)	79(54.1%)	0.454[1]
Present	33(40.7%)	48(59.3%)	

[1] chi-square test value for independence; [2] Fisher's exact test value.

Source: Data obtained from the survey, 2021

Table 5. Final adjustment of the Poisson model for Nutritional risk in older people infected with HIV/AIDS assisted in Reference Units, Recife, PE, 2021

Evaluated factors	PR	CI (95%)	*p*-value*
Sex			
Male	1.00	-	-
Female	2.09	1.56 - 2.80	<0.001
Education			
Over 11 years	1.00	-	-
9 to 11 years	1.04	0.57 - 1.90	0.89
5 to 8 years	1.06	0.60 - 1.89	0.84
1 to 4 years	1.73	1.02 - 2.94	0.041
Illiterate	1.25	0.68 - 2.30	0.474
Waist circumference			
Very high risk	1.00	-	-
High risk	1.35	0.89 - 2.03	0.157
No risk	2.50	1.73 - 3.61	<0.001
Depressive symptoms*			
No suspected depression	1.00	-	-
With suspected depression	1.34	1.02 - 1.75	0.035

PR = Prevalence ratio; CI = Confidence Interval; **p*-value from the Wald test.

DISCUSSION

This study demonstrated a high prevalence of nutritional risk among older people with HIV, given that it presents itself as a "sentinel event" in situations of AIDS and co-infections. Thus, malnutrition in this group presents itself in greater magnitude, providing disadvantages such as: increased morbidity and mortality and opportunistic infections, reduced drug efficacy and reduced serum albumin levels. Nutritional care is even more important because it minimizes muscle loss and the risk of death[15], and it is crucial to identify the nutritional risk and intervene early on.

Although there are no indicators of nutritional status or specific classification for HIV carriers[14], nor a lack of studies in the recent literature that address older people as a target group for investigation related to nutritional aspects, this study contributed to Gerontology with: the importance of inserting the MNA, a reference instrument[7] for the early

identification of malnutrition, even in eutrophic and overweight individuals at risk of developing malnutrition.

A meta-analysis carried out in 2019[15] showed that malnutrition is one of the most common problems among people living with HIV, contributing to premature death and the development of comorbidities in older people with this virus. However, the biggest obstacle is related to inadequate and underdiagnosed screening of the risk of developing malnutrition, silently increasing its prevalence, often aggravated by the appearance of comorbidities, especially tuberculosis[15-18].

Regarding the factors associated with risk, although they are not dissociated from each other, they will be addressed separately. The first, related to the influence of sex, it is observed that although HIV is more prevalent in men[19], as was also demonstrated in this study, it is verified that the group of female patients presents a significant increase of 109% for the nutritional risk when compared to male patients. This situation may be related to the process of feminization of aging, because although the woman is a survivor of the disease, she brings with her the accumulation of disadvantages in aging, related to financial condition, lower income and greater food insecurity to purchase food[19-23].

Despite greater attendance at health services, women are more socially stigmatized, in the condition of "receiver of the virus", which may discourage self-care, considering that the diagnosis of the disease is seen almost as a death sentence[24]. In addition, the female age group from 20 to 59 years, which covers the period prior to aging, has a higher risk of developing opportunistic infections compared to men, using viral load as an immunological evaluation criterion[20].

The physiological process also justifies the greater vulnerability of older women to changes in nutritional status in aging[21], since the loss of muscle mass is more intense in this group, especially in the initial phase of aging, age identified in 60% of the women in this investigation. In contrast, for men, the greatest loss occurs at older age, although women are more prone to dehydration and osteopenia[25].

The second associated factor is education. It appears that the significant increase in nutritional risk was found only for the group that studied from 1 to 4 years, in which the risk is 73% higher when compared to the group of patients who studied for more than 11 years. For illiterate patients, with 5 to 8 years of schooling and 9 to 11 years of schooling, the nutritional risk was higher than the group of patients who studied more than 11 years, however, the increased risk is not significant among these groups.

The relationship between education, income and HIV impoverishment is widely discussed in the literature. The lower the level of education, the more insufficient the income and the more precarious the purchase of food, the access to health services and guidance by health professionals, the greater the damage to self-care[19]. Thus, in addition to the changes related to the natural process of aging, older people are still faced with food insecurity, when there is little financial resource for the choice and acquisition of adequate food, compromising the quality and quantity of food, impacting the nutritional condition[26,27].

The third associated factor is waist circumference. In the group with a measurement within the normal range, there was a significant increase in nutritional risk of 150%, compared to the group with very high risk in waist circumference. For the group at high risk in waist circumference, the non-significant increase in nutritional risk was 35% compared to the group at very high risk in waist circumference.

Despite being a protective factor against nutritional risk for analysis purposes, waist circumference is still a concern, as it contributes to an increase in cardiovascular risk. In this context, a subsequent assessment related to factors associated with excess weight can be carried out, considering its growth also among people with HIV, as demonstrated by other authors[28,29], increasing the risk of chronic diseases by five times[29,30]. It is assumed that these survivors experienced the success of ARVT, but on the other hand, increased risk factors related to current diseases, especially cardiovascular diseases.

And the fourth associated factor is related to depression. In this study, if symptoms were present in

the patient, a significant 34% increase in nutritional risk occurred when compared to patients without suspected depression.

Although the analysis of medical records identified only 5.9% of the older people infected with a diagnosis of depression and undergoing drug treatment, when screening for depressive symptoms using the GDS-15, the depressive prevalence increased to 46% of the sample, with the non-nutritional factor presenting the strongest association. An underreporting of depression is assumed, requiring identification to include measures such as social and psychological support and more comprehensive care for the patient[30].

Studies point to the relationship between malnutrition and depression[22,30-32]. Changes in body weight can affect mood, self-image and symptoms of depression, as well as being associated with risk factors for infection, such as non-adherence to ARVT, which further worsens nutritional status. These authors reinforce the strong effects of gender, since women have a higher prevalence, incidence and risk of morbidity from depression than men[22,31,32].

The symptoms of depression are difficult to identify, but they must be investigated carefully and attentively to the stage of the disease, because often the immunological decline resulting from HIV brings symptoms similar to those of depression, such as anorexia, fatigue, weakness and weight loss. Thus, in advanced stages of the disease, the use of these signs as a diagnostic criterion for depression is of little value[33]. However, in this study, as the disease was not at an advanced stage, the result becomes more reliable and the certainty that depression also permeates seropositive older people.

People living with HIV have poor food quality[31] and lack of appetite, which, associated with depression, further compromise their nutritional condition, especially in older women, with the aggravating factors of social isolation, lack of adherence to treatment, high viral load and worsening of lack of appetite[30,31].

With regard to the limitations of the study, some points need to be mentioned: 1) for reasons related to ensuring greater adherence to treatment and minimizing the financial cost for attending the service, the delay for most users to return for at least three months made it impossible to include laboratory tests that complemented the nutritional assessment; 2) as the profile of standardized drugs for the treatment of HIV includes 2 to 3 drugs per day, polypharmacy could not be investigated in this study; 3) the type of convenience sampling selection may have generated a selection bias, but in the case of older people, and in view of a higher prevalence of individuals under 60 years of age on ARVT at the collection sites, another way to choose the participants would make the research unfeasible since the functioning of these health services, which serve extremely stigmatized people, occurs more frequently in the form of spontaneous demand.

To minimize this bias, it was decided to use more than one collection site, sample calculation and standardization of allocation of the older people (every day of the week). The importance of this research should be highlighted because it is a target group in the ≥60 years old with HIV population segment, with a multidimensional approach, contemplating sociodemographic variables, health status, functional capacity, mental health, which can be an important result for healthcare providers who care for older people with HIV.

CONCLUSION

This study portrayed a high prevalence of nutritional risk in seropositive older people, demonstrating their degree of vulnerability, especially in women, in those with low education, and with present signs of depression. Waist circumference was strongly associated with protection, although largely associated with coronary heart disease. With regard to routine follow-up in primary care, the MNA, an instrument for early risk screening, is quick and practical, and its use in nutritional practice is recommended.

It makes a significant contribution by using an instrument to identify "nutritional risk" that, despite being recommended by the Ministry of Health

and being part of the Comprehensive Geriatric Assessment (CGA), little has been used in health services aimed at HIV, not to mention that its routine use would make it possible to plan relevant intervention measures.

There are few studies that address a more complete assessment of the health situation of older people with HIV. From this perspective, the care of the older person living with HIV has been an extension of the care of adults with HIV, which should have provided a better nutritional condition, considering that the diagnosis of the disease occurred still in the phase of life that preceded aging.

In view of this scenario, it is expected that the result of this research will contribute to the establishment or routine inclusion of specific investigations for nutritional care such as the MNA, which act both in monitoring and in therapeutic intervention, aiming, in this way, at a more comprehensive care for older people living with HIV.

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REFERENCES

1. Brasil. Ministério da Saúde- Secretaria de Vigilância em Saúde – Boletim Epidemiológico - AIDS e IST, [internet].2020. [acesso em 15/01/2021].Disponível em:http://www.aids.gov.br/pt-br/pub/2020/boletim-epidemiologico-hivaids-2020.
2. Veras, RP; Oliveira, M. Envelhecer no Brasil: a construção de um modelo de cuidado. Cien SaudeColet[internet]. 2018 [acesso em 06/11/2019]; 23 (6): 1929-1936. Disponível em: http://dx.doi.org/10.1590/1413-81232018236.04722018.
3. Ferreira FC da SL, Drumond E de F, Siviero PCL, Heck GG, Machado CJ. Causas múltiplas de óbitos relacionados ao HIV/AIDS nas capitais das regiões Sul e Sudeste do Brasil 2011. Rev. Fac.Ciênc.Méd. Sorocaba[internet].2017 [acesso em 06/01/2018]; 19(1): 19-25. Disponível em: http://dx.doi.org/10.5327/Z1984-4840201727142
4. Adal M, Howe R, Kassa D, Aseffa A, Petros B. Malnutrition and lipid abnormalities in antiretroviral naïve HIV-infected adults in Addis Ababa: A cross-sectional study. PLoSOne. 2018 Apr 19;13(4):e0195942. doi: 10.1371/journal.pone.0195942. PMID: 29672576; PMCID: PMC5908150.
5. Tavares, EL; Santos, DM dos; Ferreira, AAS. Avaliação nutricional de idosos: desafios da atualidade. Revista Rev. bras. geriatr. gerontol. [internet]. 2015[acesso em 02/03/2020], 18 (3): 643-650. Disponível em: http://dx.doi.org/10.1590/1809-9823.2015.14249.
6. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician.JPsychiatr Res[internet]. 1975[acessoem11/05/2016]; 12(3):189–98. Disponívelem: http://dx.doi.org/10.1016/0022-3956(75)90026-6
7. Kaiser MJ, Bauer JM, Ramsch C, Uter W, Guigoz Y, Cederholm T, Thomas DR, Anthony P, Charlton KE, Maggio M, Tsai AC, Grathwohl D, Vellas B, Sieber CC. Validation of the Mini Nutritional Assessment short-form (MNA-SF): a practical tool for identification of nutritional status. J Nutr Health Aging[internet]. 2009[acesso em 06/05/2016]; 13:782-788. Disponível em: http://dx.doi.org/10. 1007/s12603-009-0214-7
8. Ministério da Saúde (Brasil) Secretaria de Vigilância em Saúde. Departamento de Análise de Situação de Saúde. Plano de ações estratégicas para o enfrentamento das Doenças Crônicas Não Transmissíveis (DCNT) no Brasil 2011-2022. [internet].2011[acesso em 22/07/2018]; Disponível em: http://bvsms.saude.gov.br/bvs/publicacoes/plano_acoes_enfrent_dcnt_2011.pdf.
9. Minosso JSM, Amendola F, Alvarenga MRM, De Campos Oliveira MA. Validação, no Brasil, do Índice de Barthel em idosos atendidos em ambulatórios. ACTA Paul Enferm.[internet].2010[acesso em 06/05/2016]; 23(2): 218–23. Disponível em: http://dx.doi.org/10. 1590/S0103-21002010000200011
10. Yesavage JA, Sheikh JI. GeriatricDepressionScale (GDS). ClinicalGerontologist[internet]. 1986[acesso em 03/05/2017];5:1-2, 165-173.Disponível em: http://dx.doi.org/10.1300/J018v05n01_09
11. World Health Organization (Genebra) Physical status: the use and interpretation of anthropometry WHO Technical Report Series 854: WHO [internet].1995[acessoem 09/03/2017]. Disponívelem:http://www.who.int/nutrition/publications/growth_physical_status/en

12. Lohman TG, Roche AF, Martorell R. Anthropometric standardization reference manual. Champaign I: HKB, editor. HumKinet Books[internet]. 1988[acesso em 23/04/2017];177. Disponível em: http://dx.doi.org/10.1002/ajhb.1310040323

13. Han TS, van Leer EM, Seidell JC, Lean ME. Waist circumference action levels in theidentification of cardiovascular risk factors: prevalence study in a random sample. BMJ [internet].1995[acesso em 20/03/2017]; 311(7017):1401-5. Disponível em: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2544423/.

14. Centers for Disease Control and Prevention (US). Revised Classification System for HIV Infection and Expanded Surveillance Case Definition for AIDS Among Adolescents and Adults. Morbidity and Mortality Weekly Report.[internet]. 1993 [acessoem20/03/2019];Disponívelem: http://www.cdc.gov/mmwr/preview/mmwrhtml/00018871.htm.

15. Alebel A, Demant D, Petrucka P, Sibbritt D. Effects of undernutrition on mortality and morbidity among adults living with HIV in sub-Saharan Africa: a systematic review and meta-analysis. BMC InfectDis. 2021 Jan 4;21(1):1. doi: 10.1186/s12879-020-05706-z. PMID: 33390160; PMCID: PMC7780691.)

16. Costa CS, Arruda Neto CL, Câmpelo WF, Mendes ALRF.Associação entre diferentes métodos de avaliação nutricional em pacientes com HIV/AIDS em um hospital público.RevBrasPromoç Saúde, Fortaleza [internet]. 2017[acessoem06/12/2019];30(3): 1-9 Disponívelem: https://dx.doi.org/10.5020/18061230.2017.6136

17. Thimmapuram R, Lanka S, Esswein A, Dall L. Correlation of Nutrition with Immune Status in Human Immunodeficiency Virus Outpatients. Mo Med. [internet]. 2019[acesso em 09/10/2021];116(4):336-339. Disponível em: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6699812/

18. Cruz V, Bernal L, Buitrago G, Ruiz ÁJ. Frecuencia de riesgo de desnutriciónsegúnla Escala de Tamizado para Desnutrición (MST) enunservicio de Medicina Interna [Screening for malnutritionamonghospitalizedpatients in a ColombianUniversity Hospital]. Rev Med Chil. [internet]. 2017 [acesso em 09/09/2021];145(4):449-457. Acesso em: http://dx.doi.org/10.4067/S0034-98872017000400005.

19. Silva,SRA. ; Marques,APO ; Leal, MCC. Pessoas com 50 anos e mais com HIV/AIDS no Brasil: quem são? Estudos interdisciplinares sobre o envelhecimento [internet].2018 [acesso em 06/12/2019]; 23 (2): 149-164. Disponível em:https://seer.ufrgs.br/RevEnvelhecer/article/view/75018/52452

20. Marin-Leon L, Francisco PMSB, Segall-Corrêa AM, Panigassi G. Bens de consumo e insegurança alimentar: diferenças de gênero, cor de pele autorreferida e condição socioeconômica. RevBrasEpidemiol[internet]. 2011[acesso em 18/10/2019];14(3):398–410. Disponível em: http://dx.doi.org/10.1590/S1415-790X2011000300005

21. Papagianni, M ;Tziomalos, K. Obesity in patients with HIV infection: epidemiology, consequences and treatment options, Expert Review of Endocrinology &Metabolism[internet]. 2016[acesso em 24/05/2017];11(5): 395-402. Disponível em: http://dx.doi.org/10. 1080/07399332.2017. 1337774

22. Chop, Eet al.Food insecurity, sexual risk behavior and adherence antiretroviral therapy among women living with HIV: Asystematic review.Health Care Women Int.[internet];2017 [acessoem 10/01/2019]: 38(9): 927–944.Disponível em: http://dx.doi.org/: 10.1080/07399332.201

23. Andrade J, Ayres JA, Alencar RA, Duarte MTC, Parada CMG de L. Vulnerabilidade de idosos a infecções sexualmente transmissíveis. ACTA Paul Enferm.[internet].2017[acesso em 10/10/2019]; 30(1): 8-15. Disponível em: http://dx.doi.org/10. 1590/1982-0194201700003

24. Alexandre,T da S; Duarte, YAO; Santos, JLF; Lebrão, ML. Prevalência e fatores associados à sarcopenia, dinapenia e sarcodinapenia em idosos residentes no Município de São Paulo – Estudo SABE. Revista brasileira de epidemiol[internet].2018[acesso em 10/10/2019]; 21(supl.22): 1-13. Disponível em: http://dx.doi.org/10.1590/1980-549720180009.supl.2

25. Andressa Botton, A; Cúnico, SD; Marlene Neves Strey, MN. Diferenças de gênero no acesso aos serviços de saúde: problematizações necessárias-Mudanças – Psicologia da Saúde [internet].2017[acesso em 01/01/2022]. Disponível em: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-869142

26. Araújo, Ana Paula Serra de, BERTOLINI, Sônia Maria Marques Gomes; BERTOLINI, Dennis Armando. Perfil epidemiológico e imunológico de idosos infectados pelo vírus HIV da imunodeficiência humana. Estudos interdisciplinares sobre o Envelhecimento, Porto Alegre [internet].2015[acesso em 19/04/ 2019]; 20 (1): 121-138,. Disponível em: www.seer.ufrgs.br/RevEnvelhecer/article/view/45225>.

27. Confortin, et al. Fatores associados ao estado nutricional em idosos participantes do Estudo "EpiFloripa Idoso" Demetra[internet].2016[acesso em18/11/2017]11(supl.1): 1333-1350. Disponível em: http://www.e-publicacoes.uerj.br/index.php/demetra/article/view/22093/19457#.WhD2JEqnE2w.

28. Villahermosa, M.L.Factores de riesgo para sobrepeso, obesidad y desnutriciónen pacientes VIH (+) que asisten a consulta nutricional enel Centro de Atención a Pacientes conEnfermedades Infecto Contagiosas de laFacultad de Odontología. Acta odontológica venezolana[internet].2013[acesso em 05/08/2020] 51 (2). 2, 2013. Disponível em: https://www.actaodontologica.com/ediciones/2013/2/art-4

29. Beraldo, RA; Santos, AP; Guimarães, MP. Redistribuição de gordura corporal e alterações no metabolismo de lipídeos e glicose em pessoas vivendo com HIV/AIDS, Rev. bras. epidemiol. [internet].2017 [acesso em 05/08/2020] 20 (03): 526-536. Disponível em: https://doi.org/10.1590/1980-5497201700030014

30. Joint United NationsProgramon HIV/AIDS -UNAIDS – WHO (Geneva). GLOBAL AIDS UP DATE 2016. [internet]. 2016[acesso em 18/07/2019]. Disponível em: http://www.unaids.org/en/resources/documents/2016/Global-AIDS-update-2016.

31. Coutinho, MFC; Dwyer, GO; Frossard, V. Tratamento antirretroviral: adesão e a influência da depressão em usuários com HIV/AIDS atendidos na atenção primária. Revista Saúde em debate [internet]. 2018 [acesso em 12/04/2020]:42 (116): 148-161. Disponível em:http://dx.doi.org/10.1590/0103-1104201811612

32. Tesfaye et al. Food insecurity, mental health and quality of life among people living with HIV commencing antiretroviral treatment in Ethiopia: a cross-sectional study Health and Quality of Life Outcomes [internet]. 2016 [acessoem 12/04/2020]14(37):1-8. Disponívelem:http://dx.doi.org/10.1186/s12955-016-0440-8

33. Sheer, LS et al., HIV and Depression – a systematic review of interventions, Psychology, Health & Medicine [internet]. 2011[acesso em 10/01/2019]; 16(5): 493-527. Disponível em: http://dx.doi.org/10.1080/13548506.2011.579990